

**TITLE OF THE INVENTION**

**POULTRY LITTER FERTILIZER**

**BACKGROUND OF THE INVENTION**

5      **1.      Field of the Invention**

This invention generally relates to fertilizers and, more specifically, to a system and method for manufacturing fertilizers from poultry litter.

**2.      Description of Related Art**

Poultry litter is one of the most valuable litters produced by livestock.

10      Poultry litter is a very good source of plant nutrients and soil amendment when properly processed. In particular, poultry litter is managed primarily for its nitrogen (N) value. However, nitrogen availability from poultry litter is the most difficult of the three primary nutrients (nitrogen (N), phosphate ( $P_2O_5$ ) and potassium ( $K_2O$ )) to predict. About one-third of the total nitrogen in poultry litter  
15      is in the ammonium form ( $NH_4-N$ ) and the rest is in an organic form. The amount of nitrogen available for plant uptake is ammonium nitrogen plus the amount of organic nitrogen that mineralizes during the growing season. Poultry litter has the following average nutrient content: a fertilizer grade of about 3-3-3 (N- $P_2O_5$ - $K_2O$ ); total nutrients of about 60-60-60 (lbs/ton); and available nutrients of first season of  
20      about 40-40-30 (lbs/ton).

Poultry litter is most valuable immediately after it is removed from the poultry house. The nitrogen in the litter can be preserved if it is stored in an enclosed structure (e.g., dry storage barn) or in a deep covered pile. Poultry litter should be handled like commercial fertilizers and should not be stored outside and exposed to the weather. Litter stored outside and exposed to the weather will decompose rapidly, and rain can leach valuable nutrients into surface waters. Moreover, when poultry litter is exposed to air and moisture, the ammonium form of the total nitrogen ( $\text{NH}_4\text{-N}$ ) is converted to the organic form. This composted litter or litter that has been exposed to the weather over time is less valuable to the crop. Currently, there is no effective and environmentally sound solution for managing surplus poultry litter and, thus, there is a need for an effective system and method for manufacturing fertilizers from poultry litter.

### **SUMMARY OF THE INVENTION**

Exemplary embodiments of the invention include systems and methods for manufacturing fertilizer nutrients from poultry litter. Features of the invention include heating and pasteurizing raw material; drying the heated and pasteurized material; reducing the dried material to a powder; and pelleting the powder to granular and homogenized pellets. The poultry litter fertilizer is high in nitrogen and provides a good source of nutrients for many crops.

### **BRIEF DESCRIPTION OF THE DRAWINGS**

The accompanying drawings, which are incorporated in and constitute a part of the specification, illustrate exemplary embodiments of the invention and,

together with the detailed description of the invention, explain various aspects and principles of the invention.

FIG. 1 is an illustration of a system for manufacturing fertilizer from poultry litter in accordance with an exemplary embodiment of the invention; and

5        FIG. 2 is a flowchart illustrating a method for manufacturing fertilizer micronutrients according to an exemplary embodiment of the invention.

### **DETAILED DESCRIPTION OF THE INVENTION**

The following detailed description refers to the accompanying drawings that illustrate exemplary embodiments of the invention. Other embodiments are possible and modifications may be made to the exemplary embodiments without departing from the spirit and scope of the invention. Rather, the scope of the invention is defined by the appended claims.

FIG. 1 is an illustration of a plant 100 for manufacturing fertilizer from poultry litter in accordance with an exemplary embodiment of the invention. The fertilizer manufacturing plant 100 includes a raw area ventilation system 105, a raw feed system 110, a dryer system 115, a pelleting and screening system 120, and a finish area ventilation system 125. To begin, surplus litter is transported from farms to the fertilizer manufacturing plant 100 by specially-designed, sealed trucks so as to preserve the nitrogen in the litter. The trucks unload the surplus litter inside the fertilizer manufacturing plant 100, where the raw area ventilation system 105 operates to prevent dust and odor from escaping to the environment. The raw area ventilation system 105 includes special filters 106 and scrubbers 107 that ensure that the air leaving the plant is just as clean or cleaner than the outside air.